

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
10 June 2004 (10.06.2004)

PCT

(10) International Publication Number
WO 2004/047882 A3

(51) International Patent Classification⁷: A61L 31/16, 29/16, 27/54, B05B 5/025

(21) International Application Number: PCT/US2003/036717

(22) International Filing Date: 18 November 2003 (18.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 10/301,473 21 November 2002 (21.11.2002) US

(71) Applicant: REGENTS OF THE UNIVERSITY OF MINNESOTA [US/US]; 450 McNamara Alumni Center, 200 Oak Street S.E., Minneapolis, MN 55455 (US).

(72) Inventors: PUI, David, Y., H.; 12855 34th Avenue North, Plymouth, MN 55441 (US). CHEN, Da-Ren; 13105 Belgrave Farm Drive, Creve Coeur, MO 63141 (US).

(74) Agent: GEBHARDT, Mark, J.; Mucting, Raasch & Gebhardt, P.A., P.O. Box 581415, Minneapolis, MN 55458-1415 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

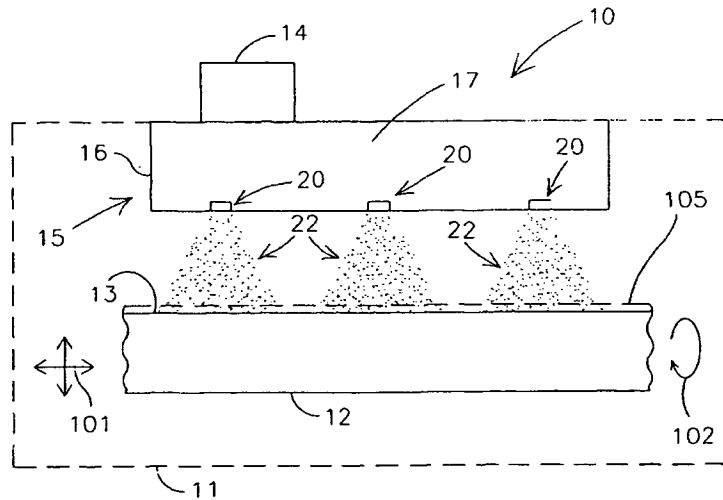
Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
15 July 2004

[Continued on next page]

(54) Title: COATING MEDICAL DEVICES



(57) Abstract: Methods and systems for coating at least a portion of a medical device (e.g., a stent structure) include providing a plurality of coating particles (e.g., monodisperse coating particles) in a defined volume. For example, the particles may be provided using one or more nozzle structures, wherein each nozzle structure includes at least one opening terminating at a dispensing end. The plurality of coating particles may be provided in the defined volume by dispensing a plurality of microdroplets having an electrical charge associated therewith from the dispensing ends of the one or more nozzle structures through use of a nonuniform electrical field between the dispensing ends and the medical device. Electrical charge is concentrated on the particle as the microdroplet evaporates. With a plurality of coating particles provided in the defined volume, such particles can be moved towards at least one surface of the medical device to form a coating thereon (e.g., using an electric field and/or a thermophoretic effect).

WO 2004/047882 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

II. Serial Application No.
PCT/US 03/36717

A. CLASSIFICATION OF SUBJECT MATTER				
IPC 7 A61L31/16		A61L29/16	A61L27/54	B05B5/025
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols)				
IPC 7 A61L B05B				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)				
EPO-Internal, WPI Data, PAJ				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category *	Citation of document, with indication, where appropriate, of the relevant passages			Relevant to claim No.
P,X	US 2003/143315 A1 (CHEN DA-REN ET AL) 31 July 2003 (2003-07-31) page 1, paragraph 12 -page 2, paragraph 17 page 3, paragraph 20 - paragraph 21 claims 1-106 ---- -/-/			1-106
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.		<input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed				
Date of the actual completion of the international search		Date of mailing of the international search report		
14 May 2004		26/05/2004		
Name and mailing address of the ISA		Authorized officer		
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax (+31-70) 340-3016		Menidjel, R		

INTERNATIONAL SEARCH REPORT

Int'l Application No
PCT/US 03/36717

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	<p>WO 03/082363 A (SCIMED LIFE SYSTEMS INC) 9 October 2003 (2003-10-09)</p> <p>page 2, line 26 -page 3, line 17 page 4, line 6 - line 25 page 5, line 10 -page 6, line 5 figures 1-8 claims 1-20</p> <p>-----</p>	<p>1,6, 8-12,14, 15,21, 22,25, 28,29, 33,41, 49,51, 52, 80-82, 87,89, 93,103, 105</p>
A	<p>US 2002/007869 A1 (CHEN DA-REN ET AL) 24 January 2002 (2002-01-24) cited in the application The whole document.</p> <p>-----</p>	1-106
A	<p>WO 01/87491 A (CHEN DA REN ;PUI DAVID Y H (US); UNIV MINNESOTA (US)) 22 November 2001 (2001-11-22) cited in the application The whole document.</p> <p>-----</p>	1-106

Form PCT/ISA210 (continuation of second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int'l Application No
PCT/US 03/36717

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 2003143315	A1	31-07-2003	US	2002007869 A1		24-01-2002
WO 03082363	A	09-10-2003	US	2003185964 A1		02-10-2003
			WO	03082363 A1		09-10-2003
US 2002007869	A1	24-01-2002	US	2003143315 A1		31-07-2003
			AU	6162501 A		26-11-2001
			CA	2409093 A1		22-11-2001
			CN	1443095 T		17-09-2003
			EP	1282470 A1		12-02-2003
			JP	2004500975 T		15-01-2004
			WO	0187491 A1		22-11-2001
WO 0187491	A	22-11-2001	AU	6162501 A		26-11-2001
			CA	2409093 A1		22-11-2001
			CN	1443095 T		17-09-2003
			EP	1282470 A1		12-02-2003
			JP	2004500975 T		15-01-2004
			WO	0187491 A1		22-11-2001
			US	2002007869 A1		24-01-2002